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NOTES ON THE MAMMALS OF NORTHERN LAKE COUNTY,  
MINNESOTA

BY CHARLES EUGENE JOHNSON

Lake County, Minnesota, lies well within the Canadian life zone. Its northern two-thirds, approximately, is in the Hudson's Bay drainage basin. The portion with which the following notes are concerned is included in what is known as the Superior National Forest and is a large forest-covered area the surface of which is somewhat hilly and rough but abundantly supplied with lakes and streams. The principal forest trees are spruce, jack-pine, balsam fir, cedar, a certain amount of Norway pine and white pine, and birch and poplar. Dense growths of alder fringe many of the streams but here and there the water courses are bordered by strips of marsh land of varying widths; and bogs and swamps are of frequent occurrence. Altogether there is a considerable variety of habitat so that the region is in many respects ideal as a wild life preserve. It is uninhabited and conditions are essentially undisturbed by man except in one or two portions where the timber had been removed a good many years ago, or more recently as indicated subsequently. Since the area was made a forest and game preserve some ten or more years ago the wild life within it has enjoyed full protection, but previous to that time it had been extensively trapped. Very recently a limited number of reliable trappers have been licensed by the State Game Commissioner to enter the territory to trap wolves and also a number of other carnivorous fur-bearers which were believed to be sufficiently plentiful to warrant a certain amount of trapping.

The following list, with the exceptions therein stated, contains the mammalian species observed and taken by me personally in the course of a number of summers devoted principally to motion-picture photography of Minnesota big game, under the patronage of Mr. James F. Bell of Minneapolis. This work was carried on during the seasons of 1912 to 1915 inclusive and the specimens taken within this period are in the collections of the Zoological Museum, University of Minnesota. In the latter part of last summer (1920) I returned to this region for a brief survey of the territory covered in the previous years and some of the changes that had taken place are remarked upon later in this paper. For some of the smaller mammals listed the present records are too meager to establish either their relative abundance or their distribution within the area in question. It is my hope, however, if opportunity offers, to add to these notes in the future.

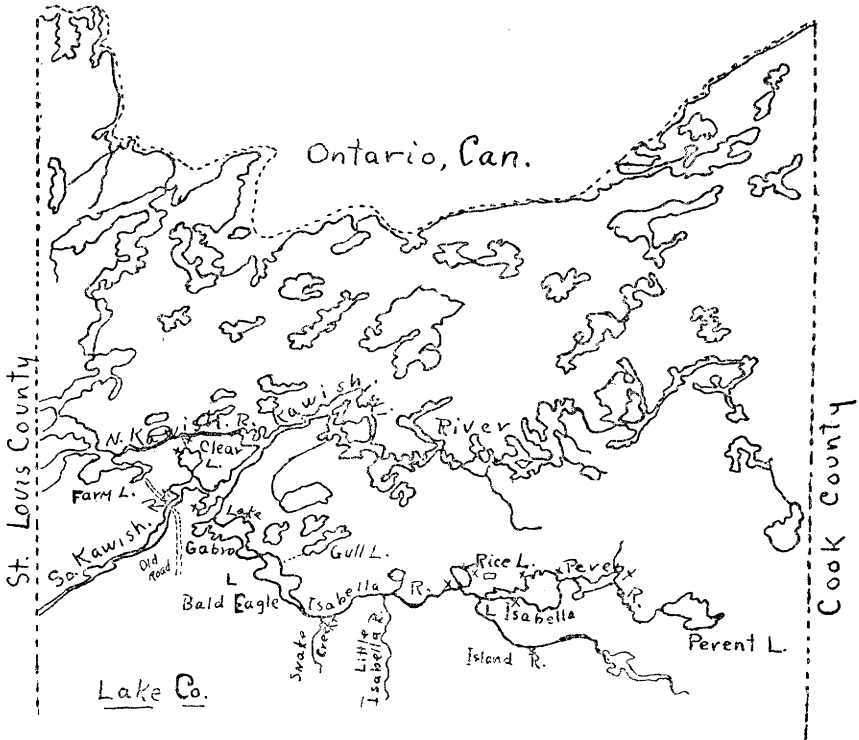


FIG. 1. OUTLINE MAP OF NORTHERN LAKE COUNTY, MINNESOTA, SHOWING PRINCIPAL LOCALITIES MENTIONED IN THE TEXT

The accompanying outline map is included for the purpose merely of indicating the principal localities mentioned in the text.

Specimens of *Tamias*, *Eutamias*, *Peromyscus*, *Evotomys*, *Microtus*, *Synaptomys*, and *Mustela cicognanii* have been examined and identified as listed, by the U. S. Biological Survey. In regard to the beaver of this region, it is possible that it is to be assigned to the rather recently described subspecies *michiganensis* of Bailey, but this awaits verification by actual comparison.

***Odocoileus virginianus borealis*.** Northern White-tailed Deer.—Common. A total of 132 deer was seen, among which were 38 bucks, 63 does, 12 fawns and 19 which could not be identified as to sex. More deer were always seen in the closer-in localities than in the more remote parts where the timber wolf no doubt was largely responsible for their smaller numbers as well as their greater wariness. Along the water courses of this region are numerous little grassy bays which are much sought as feeding grounds by the deer. A number of times deer were met with on islands, in both lakes and rivers, some of them no more than an acre or two in size, and none more than fifty or seventy-five yards distant from the mainland. The animals probably had become accustomed to a sense of security on these islands and sought them for resting places, for they had but little attractiveness as feeding grounds. Specimens from N. and S. Kawishiwi districts; L. Isabella.

***Alces americanus*.** Moose.—When I first entered this region, in 1912, moose were very common in the North and the South Kawishiwi River district, and eastward and southeastward as far as our observations extended, namely to the Perent River. Also during the three seasons that followed moose were plentiful and distinctly appeared to be increasing. In 1915 alone, during a period of about nine weeks, 132 moose were seen and trails and wallows were abundant about the water courses. I did not visit the region again until the summer of 1920, when, to my surprise and disappointment I met with a total of only 5 moose from July 26 to September 4. Signs seemed to indicate that the bulk of the moose population had deserted the territory. Many of their favorite feeding grounds of former years bore no signs of having been frequented by moose this season. It is my belief that this disappearance of the moose was the result chiefly of disturbances due to logging operations that had been carried on in the intervening period, along the North and South Forks of the Kawishiwi and along the main stream further eastward. If this be true then one may hope for a gradual return of the moose with the restoration of normal quiet. Specimens from Clear L.; S. Kawishiwi; L. Bald Eagle.

***Rangifer caribou caribou*.** Woodland Caribou.—I have personally no positive evidence of the presence of caribou in the part of Lake County covered by these notes. However, at Saw Bill Lake in Cook County, about six or eight miles from the eastern border of Lake County, it was reported to me by Mr. Leslie Brownell, then forest supervisor, that a number of caribou had been seen in the winter of 1917. Mr. R. G. Schreck, present acting supervisor, reports that a number of caribou are still found in that same general region.

According to Mr. John Schafer, municipal judge of Ely, caribou were common along the Kawishiwi River in Lake County, twenty years ago, being found as far westward as Farm Lake. He mounted several heads from specimens killed in Twp. 63, R. 10, in this county. Logging then began and the animals left the district.

***Glaucomys sabrinus sabrinus*.** Northern Flying Squirrel.—August 23, 1913, a male was trapped on the ground at the foot of a cedar, at the lower end of the first rapids of the Isabella River above Lake Bald Eagle. September 4 a female was taken on a fallen log about 30 rods distant from this place. These were the only specimens secured, but the species is probably of regular occurrence in suitable localities throughout the region.

**Sciurus hudsonicus hudsonicus.** Red Squirrel.—Of general occurrence in this territory but in no locality visited did the species seem to be plentiful. The squirrels were most in evidence in localities where cedars occurred. On the seeds of these trees the animals always seemed to feed abundantly and the ground in such places was often literally covered with cedar cones. The species as a rule was found very quiet in this region, rarely indulging in its scolding chatter. Specimens taken on the North Kawishiwi—Clear Lake portage; at the outlet of Lake Bald Eagle; at the Isabella River rapids at Bald Eagle; and at Rice Lake.

**Tamias striatus griseus.** Gray Chipmunk.—Common in suitable localities throughout the region. Specimens taken on the North Kawishiwi—Clear Lake portage; on the South Kawishiwi in the Clear Lake region; at the Isabella River rapids at Bald Eagle.

**Eutamias borealis neglectus.** Long-tailed Chipmunk.—Found in all the localities in which the preceding species occurred, and apparently was more numerous; it was certainly more in evidence. Several of each species usually congregated about our camp wherever we remained for any length of time. At one point where a trail crew had left a peck of oats in a box, a half dozen or more of each kind often feasted together in reasonable harmony while it lasted, but the smaller species seemed to have some fear of the larger. Specimens from the same localities as for *Tamias*.

**Marmota monax canadensis.** Canada Woodchuck.—While apparently of general distribution it was nowhere found to be very common. A specimen was taken June 19, on the north shore of Clear Lake; it apparently had its den in a crevice among some rocks. A half-grown specimen in the black phase was taken along the South Kawishiwi, July 24. Other localities where records were obtained are: north shore of Gabro Lake, specimen shot July 31; Isabella River rapids at Bald Eagle, one seen August 15; northeast shore of Lake Isabella, specimen shot by Prof. N. L. Huff, August 28. The first three records are for 1912, the last two for 1913 and 1914 respectively.

**Castor canadensis.** Beaver.—In 1912 no recent signs of beavers were found along the route followed from the North Kawishiwi southeastward, until we reached the Little Isabella River, although careful scrutiny was made along all the water courses between these two points. Along the Little Isabella, however, many fresh workings were located, evidently of animals that had come down from the headwaters of this stream where a colony was known to have existed a year or two before. The following season a new lodge was discovered down stream on the Isabella River, about a mile above Bald Eagle, and in 1914 and 1915 very notable extensions of operations were observed along the Isabella from this point eastward nearly to Perent Lake; while a single lodge had been built at "Dead Man's Rapids" on the North Kawishiwi. When I returned to this territory in 1920 it was apparent immediately that a great spread of the beaver had taken place during the intervening period. More than a score of lodges were located beyond those recorded in 1915 and as time did not permit our covering all of the localities examined in that season there is no doubt that many more might have been found. In addition to lodges there were of course many new operations such as dams and cuttings, and numerous beavers were seen. Several lodges of the former years were still occupied and had grown to much larger dimensions. On August 2 a young beaver about the size of a full-grown muskrat

was surprised and caught in the hand near one of the recently built lodges. Specimens from L. Isabella; L. Bald Eagle; Isabella River.

**Peromyscus maniculatus gracilis.** Deer Mouse.—Abundant in all parts of the territory. This species was taken in a variety of situations such as the exposed floor of deep woods, in open grassy places, on fallen logs and under logs, and one specimen was taken on the limb of a cedar about four feet from the ground. Two stomachs that were opened contained green vegetable matter, seeds, the remains of some insect larvæ and shields and other skeletal parts of insects.

**Eutamias amoenus loringi.** Red-backed Vole.—It is a question in my mind whether this or the preceding species should be given first place in point of numbers. Both were found a nuisance because of the frequency with which they got into the traps and interfered with the catching of more desirable species. The red-backed vole was taken in broad grassy meadows bordering water courses, on exposed rock outcrops, in boggy places within the deeper woods, on logs and under logs and over the forest floor generally. June 25 a female was taken which contained 8 embryos in early stages of development; another pregnant female was taken August 4.

**Microtus pennsylvanicus pennsylvanicus.** Meadow Mouse.—This mouse was not found to be very common but may be more plentiful than the results of the trapping would seem to indicate. Specimens were taken in the following localities: North Kawishiwi end of the Clear Lake portage; on an old logging road where it crosses the South Kawishiwi west of Clear Lake; along Snake Creek near L. Bald Eagle; on the second portage of the Isabella above Bald Eagle.

**Ondatra zibethica zibethica.** Muskrat.—Common along the streams. The muskrat rarely builds its characteristic "houses" in this region, the animals living usually in bank burrows, and in some localities apparently among rock crevices at the edge of the water. July 23 five young about one-third grown were taken at a "house" on the North Kawishiwi a short distance above "Dead Man's Rapids;" and on the same day in a nearby locality a female was taken which contained 7 fetuses about the size of the common house mouse. The muskrats in this locality had been cutting down some young shoots of poplar, about the size of a lead pencil in thickness, from which the leaves had been stripped and eaten, as was shown by the stomach contents. I employed such shoots and also those of dwarf maple successfully as bait in trapping the muskrat in this and other localities.

**Synaptomys fatus.** Bog-lemming.—A single specimen of this species, a male, was taken among some dense, small shrubbery at the edge of the water, at the North Kawishiwi end of the Clear Lake portage, July 1, 1912. Continued trapping in the same locality failed to obtain more, nor were specimens secured elsewhere; but trapping on a larger scale would no doubt prove the species to be of regular occurrence in this region.

**Zapus hudsonius hudsonius.** Jumping Mouse.—Probably occurs throughout the region, in suitable localities. July 25, 1915, a jumping mouse was seen on a dry grassy knoll near the south bank of the Isabella River opposite Rice Lake. In August, 1920, a specimen was taken in a dry grassy spot at the first portage landing above Rice Lake.

**Erethizon dorsatum dorsatum.** Canada Porcupine.—Fairly common. The majority of the porcupines seen were met with while they were feeding at the edge of some lake or stream. In a number of instances they were observed eating the rhizomes of water-lilies that had been pulled up by the moose. The porcupines were at times seen to secure this food, and no doubt also other kinds found in such places, by reaching down into the water full length of the arm, feeling about until some object was encountered and then hauling it in with the hand. Half grown specimens still accompanied by the mother were several times met with.

**Lepus americanus phænotus.** Minnesota Varying Hare.—Found throughout the region but it was much more common in the underbrush along the North Kawishiwi and in the Clear Lake district than further out, as for example in the Isabella Lake region. This is very likely due to the greater number of enemies preying upon the species in the more remote localities.

**Lynx canadensis canadensis.** Canada Lynx.—I was informed by Fred Mayo, one of the trappers in this territory, that only once during the trapping season of 1919-20 did he come upon tracks of the lynx; he considered the species rare, having failed to secure a specimen during his trapping experience in this range. I was informed by Mr. John Schaefer that lynx are still occasionally brought in from other parts of Lake County.

**Lynx rufus rufus.** Wild Cat.—The only evidence I have personally obtained of the presence of the wild cat in this particular part of the county is the record among my notes of an old skull picked up in 1912 near the junction of the Island River with the Isabella. Neither of the two trappers had taken or seen any specimens of the wild cat in their operations of 1919, but Mr. R. G. Schreck informs me that the species is quite certainly present although scarce.

**Vulpes fulva.** Red Fox.—The red fox occurs in all parts of this territory, apparently in moderate numbers only. One of the trappers considered it fairly common in the Kawishiwi River and Gabro Lake districts; the other held it to be rather scarce in the Isabella River and Lake region. My own evidence is limited to three foxes seen, two of which were taken; one of the specimens was a black phase. The localities are: The South Kawishiwi about a mile below Clear Lake; the hill bordering the bay of the S. Kawishiwi southwest of the Gabro Lake portage (black specimen); Isabella River about half a mile below L. Isabella.

**Canis nubilus.** Timber Wolf.—Found in all parts of this territory but more especially in the remoter districts. Signs of the timber wolf were frequently met with from the Gabro Lake region eastward and southeastward as far as my observations extended. In September, 1912, I chanced upon one of these beasts while it was feeding upon a dead moose at the rapids of the Isabella River at Lake Bald Eagle; and in August, 1920, I shot an immature male along this same river at Rice Lake (Johnson, Journ. of Mammalogy, Feb., 1921). One of the trappers reported having seen a number of packs of wolves in this region in the winter of 1919-20. Each of the men had taken about half a dozen of the animals in their trapping operations that season. The total destruction of big game by the timber wolf in this entire region is unquestionably quite considerable.

**Lutra canadensis canadensis.** Otter.—The first signs of otters in the territory covered were seen in 1914, along the Isabella River at the first portage above Rice Lake. Here was found a recently inhabited den and also other evidence

of the presence of otters during that season. The animals themselves, however, were not seen and no attempt was made to trap for them. August 16, 1920, a female accompanied by two young was seen in the Isabella River about a mile below Isabella Lake; and on August 22, an adult accompanied by one young was seen in a beaver pond on a small stream entering Isabella Lake on the northeast shore. With continuation of the protection that the otter has enjoyed in the region for a number of years past, the species may be expected to show a steady increase.

***Mephitis hudsonica*.** Northern Plains Skunk.—My only record is for a female specimen taken at the mouth of a small stream entering the North Kawishiwi from the north, just above "Dead Man's Rapids," June 26, 1912.

***Mustela vison vison*.** Mink.—More or less common in all parts of this region. In addition to a number of minks seen at various times in other parts of the territory, specimens were taken in the following localities: West shore of Lake Bald Eagle; the junction of Snake Creek with the Isabella; the upper end of the rapids of the Isabella at Bald Eagle; north shore of Lake Isabella.

***Mustela cicognanii cicognanii*.** Common Weasel.—A female of this species was taken by one of my companions, Mr. R. C. Chapman, along the Isabella River about half a mile above Bald Eagle, August 20, 1912; in August, 1920, I saw two of these weasels at the rapids above the locality mentioned. Trapper Mayo reported the species as occurring in moderate numbers during the trapping season.

***Martes americana americana*.** Marten.—Mr. R. G. Schreck reports the marten as present but very scarce in other portions of northern Lake County but in the part visited by me I have no evidence of its occurrence; the two trappers mentioned stated that they had not secured any specimens of this species.

***Martes pennanti pennanti*.** Fisher.—The trappers reported that each had taken a number of fishers during the winter of 1919-20, and considered the species generally distributed throughout the greater part of this territory.

***Ursus americanus americanus*.** Black Bear.—Fairly common and, I believe, increasing. In addition to many signs found in various parts of the region visited, bears were seen in the following localities: 1912, northwest shore of Gabro Lake; 1913, rapids of the Isabella at Bald Eagle; 1914, North Kawishiwi River about a mile east of Farm Lake, and the northwest shore of L. Isabella (specimen); 1915, Isabella River just below Pike Falls; 1920, Island River at the first long rapids above its mouth.

***Sorex personatus personatus*.** Common Shrew.—A specimen was taken August 24, 1914, on a point of land covered with birch, poplar, spruce and balsam fir, on the east shore of Lake Isabella. The presence of the shrew was suspected in many other localities but the traps employed were rather ill adapted to the capture of these tiny mammals and this probably accounts largely for the meagerness of the catch. The species is undoubtedly of general occurrence in all this region.

***Sorex richardsonii*.** Black-backed Shrew.—A single specimen was taken in 1915, in a bog on the northwest shore of Clear Lake. The species is probably of general occurrence.

*Department of Zoology, University of Kansas, Lawrence, Kans.*